Drinking Water Investigation for the former Camp Butner, North Carolina

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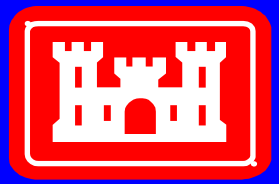


Conclusion

- **Results do not indicate high levels of any substance.**
- Naturally occurring metals frequently detected in the groundwater including iron and/or manganese.
- Lead detected above the drinking water standard at 2 locations.
- Perchlorate was found in 12 of 23 wells. All results are below/within EPA's guidance for human health protection for perchlorate.
- Additional investigation is warranted.

Investigation Objective

- Testing conducted to address public concern that groundwater and drinking water wells might be contaminated due to former military use.
- Sample potable groundwater from drinking water wells in the Camp Butner area.
- Analyze groundwater for a wide range of chemical constituents.

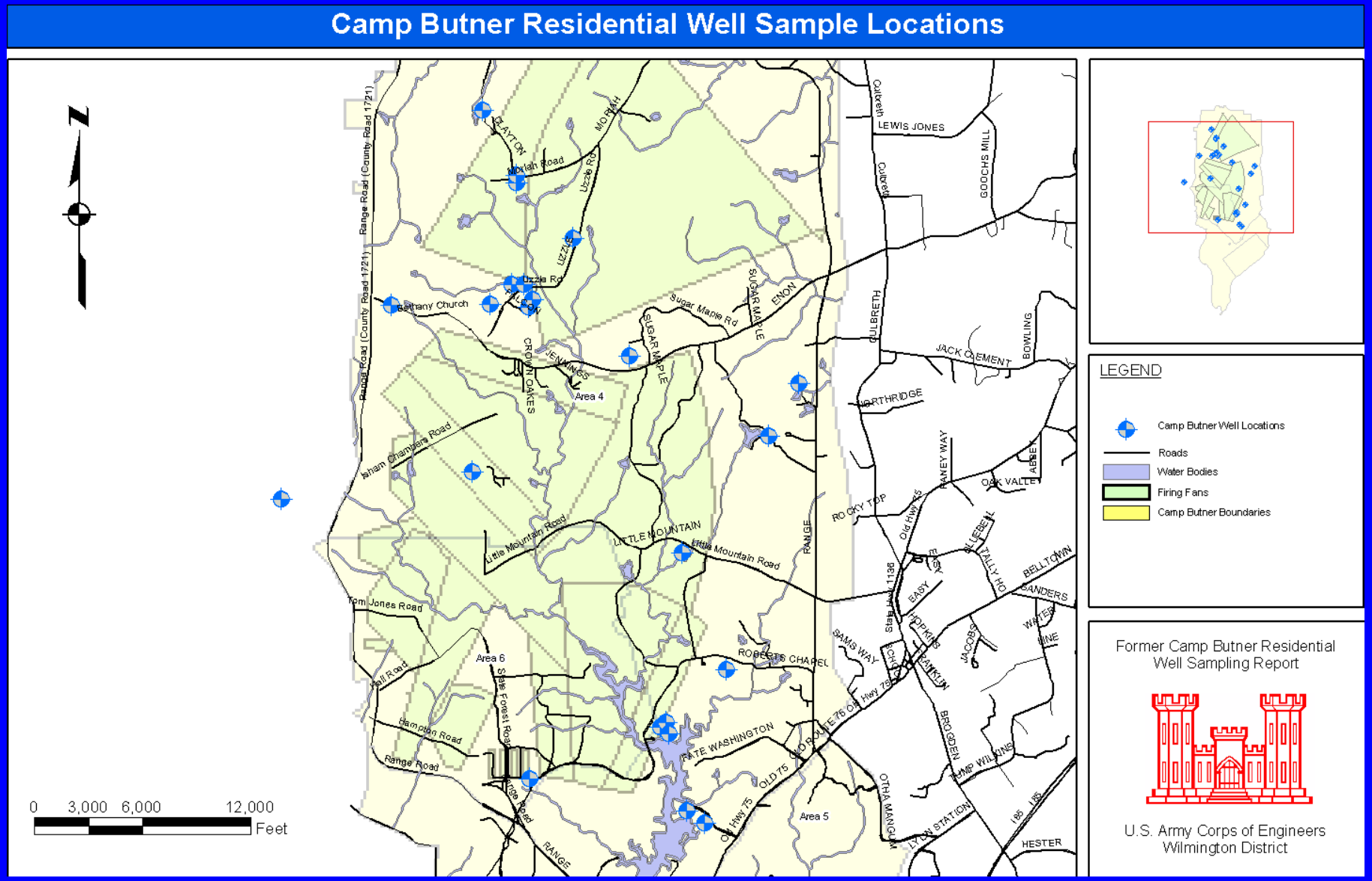
Plan Preparation

- The Sampling Analysis Plan (SAP) prepared using USACE Engineer Manual (EM 200-1-3).
- The sampling methods were consistent with USEPA Region 4 Standard Operation Procedure (SOP) for groundwater sampling.
- Well sampling request letters mailed to 38 residents.

Sample Locations

- Twenty-three wells sampled.
- Sample locations located within former range firing fans and close to unexploded ordnance or ordnance scrap discoveries.
- One sample location was outside of the former Camp Butner area for comparison.

Sample Locations



Sample Methods

- Wells were purged for a minimum of 15 minutes at a high flow rate to ensure water sampled was representative of the aquifer.
- Water quality meter used during the purge process to monitor water quality data to determine consistent water stream prior to sampling.
- Samples collected as close as possible to well and upstream (when possible) of any treatment system or storage tank.

Analysis Methods

- Samples collected from each location for laboratory analysis in the following order:
  - Volatile Organic Compounds (VOCs)
  - Semi-volatile Organic Compounds (SVOCs)
  - Pesticides/PCBs
  - Herbicides
  - Explosives and Nitroglycerin
  - Perchlorate
  - Cyanide
  - Total and Dissolved Metals

Sample Collection

Project Screening Levels

- The screening levels used for evaluation of the sampling results included the following:
  - North Carolina groundwater quality standards in 15A NCAC 02L.0202.
  - Federal Maximum Contaminant Levels (MCLs) in 40 CFR 141.61 and 141.62.
  - USEPA Region 9 Tap Water Preliminary Remediation Goals (PRGs).

Results Information

- Table 1: Project screening levels
- Table 2: Analytical results
- Table 3: Detected results

Results Summary

- Laboratory analysis for each location for 188 substances.
- Twenty-six substances detected including 19 metals which are naturally occurring elements in the earth and atmosphere.
- Ten substances detected above project screening levels including 3 metals.
- Results do not indicate high levels of any substance.

Results Summary

- VOCs
  - Methyl Tert Butyl Ether (MTBE) was detected at one location below the project screening level. Almost exclusively used as a fuel additive in gasoline.
  - Chloroform was detected at an estimated detection at one location slightly above the project screening level. Common contaminant byproduct from potable water disinfection process.

- SVOCs
  - Bis(2-Ethylhexyl)phthalate was detected at two locations slightly above the project screening level. Common laboratory contaminant introduced during the analytical process.

Results Summary

- Pesticides
  - Alpha-chlordane, gamma chlordane, and heptachlor epoxide were detected above the project screening levels at one location. May be associated with agricultural use in the area. This location was the off-site location.

- Metals
  - Iron and manganese detected at several locations above the project screening levels. Lead above the project screening level at two locations.

Results Summary

- The following substances were not detected above the detection limit at any locations:
  - PCBs
  - Herbicides
  - Cyanide
  - Explosives and nitroglycerin

- Perchlorate
  - Detected at 12 of the 23 locations ranging from 0.079 to 10.3 ug/L. Detected above the project screening level at 2 locations.

Perchlorate Sources

- Perchlorate
  - Man-made sources of Perchlorate include:
    - Oxidizing agent in munitions, fireworks and flares
    - Impurity in sodium chlorate used as a defoliant in agricultural and railroad industry for weed control
    - Used to fix dyes in the textile industry
    - Bleaching agent in the pulp and paper industry
    - Used as a component of air bag inflators
    - Manufacture of matches

Perchlorate Sources

- Perchlorate
  - Can be found naturally occurring in some fertilizers made from Chilean nitrates. These fertilizers are primarily used for certain crops which include:
    - Fruits
    - Vegetables
    - Tobacco
    - Cotton

Perchlorate Discussion

- Perchlorate
  - No current regulatory standard (NC or Federal) for perchlorate.
  - Project screening level is the EPA Region 9 PRG (3.6 ug/L). For initial screening purposes and not legally enforceable standards.
  - Current EPA guidance for human health protection for perchlorate is 4-18 ug/L.
  - All perchlorate detections were below or within the EPA guidance range.

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Questions